

# Olin Chemical Corporation

McIntosh, Alabama

Region 4

ALD008188708

## Site Exposure Potential

The 600-hectare Olin Chemical Corporation (Olin) site is located 1.6 km southeast of McIntosh, Alabama on the Tombigbee River, adjacent to and south of the Ciba-Geigy site (Figure 1; see page 63 in this report). Olin currently produces chlorine, caustic, sodium hypochlorite, and caustic plant salt using a diaphragm cell, chlor-alkali process. Rocket fuels are also formulated on-site. Predecessors of Olin Chemical first manufactured chlorine and caustic in 1951 using the mercury cell process. Later, products such as chlorinated pesticides were manufactured. These earlier products and processes were discontinued in 1987 (ERM 1989).

Solid wastes and chemicals used in various processes have historically been disposed of on-site. Olin has five permitted discharges for storm water, process and sanitary wastewater, cooling water, and treated groundwater (resulting from a RCRA corrective action). Receiving waters for these discharges include a 26-hectare lake and associated freshwater marshes (Olin Basin) with an outlet to the Tombigbee River. A series of cement-lined canals form a storm water collection system that discharges to Olin Basin. Elsewhere, natural surface drainages flow westward to Bilbo Creek or eastward to the Tombigbee River.

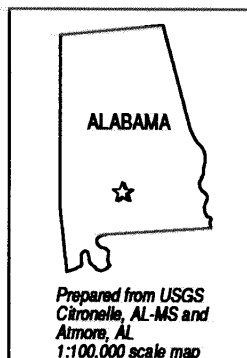
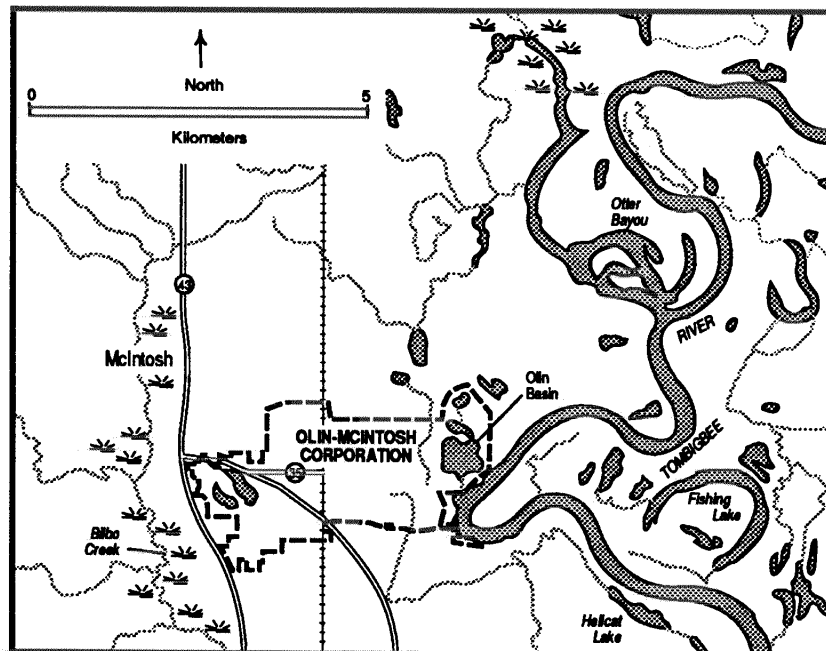


Figure 1.  
Olin Chemical  
Corporation,  
McIntosh, Alabama.



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### Site Exposure Potential, *cont.*

The site contains two separate aquifers, one alluvial and one Miocene. The shallow, alluvial aquifer is semi-confined and is recharged by infiltration from rainfall, streams, lakes, and marshes. The groundwater generally flows towards the southeast. Hydrogeologic investigations have established that the deeper aquifer is isolated from the shallow aquifer (USFWS 1986).

Surface water runoff and groundwater transport are the primary pathways of contaminant transport to NOAA resources. Contaminated sediment may act as a secondary source of toxic chemicals.

### Site-Related Contamination

Past studies indicate that groundwater, surface water, soil, and sediment are contaminated at the Olin site (Table 1; ERM 1989). The primary contaminants are mercuric compounds and chlorinated benzenes, with chlorinated pesticides also present. Between 1984 and 1985, several remedial programs were implemented at the Olin site, including sediment stabilization, capping, and excavation and disposal. This has removed some areas at the Olin site from acting as sources of contaminants but other areas continue to contribute contaminants to the groundwater, surface water, and sediment.

Table 1.  
Maximum  
concentrations of  
major contaminants  
in groundwater,  
surface water, soil,  
and sediment at the  
site.

	Water			Sediment	
	Ground- water µg/l	Surface Water µg/l	AWQC <sup>1</sup> µg/l	Sediment mg/kg	ER-L <sup>2</sup> mg/kg
<b>INORGANIC SUBSTANCES</b>					
mercury	260	2.0	0.012	60.5	0.15
<b>ORGANIC COMPOUNDS:</b>					
lindane	NR	0.6	NA	0.32	NA
endosulfan	NR	0.4	NA	0.11	NA
DDD	NR	<0.1	NA	0.15	0.002
DDE	NR	<0.1	NA	0.15	0.002
DDT	NR	<0.1	0.001	0.25	0.001
endrin	NR	<0.1	NA	0.03	0.00002
1:	Ambient water quality criteria for the protection of aquatic organisms. Freshwater chronic criteria presented (EPA 1986).				
2:	Effective range-low; the concentration representing the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and Morgan (1990).				
NR	Not reported				
NA	Screening level not available				

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### Site-Related Contamination, *cont.*

Groundwater beneath surface water impoundments on the site was contaminated with chromium, lead, and mercury. Groundwater in the historical landfill areas contained a variety of chlorinated aromatic compounds, including elevated levels of chloroform, benzene, chlorobenzene, and dichlorobenzene. Surface water samples contained high levels of mercury (USFWS 1986).

Olin Basin sediment had elevated concentrations of mercury. Studies conducted by the U.S. Fish and Wildlife Service (1986) found low levels of mercury in sediment from the Tombigbee River adjacent to the Olin site. However, largemouth bass tissue from the same area had elevated levels of mercury, ranging from 0.20 µg/g to 0.95 µg/g.

Limited data were presented for groundwater and soil at the Olin site (ERM 1989). Volatile organic compounds (chloroform, benzene, and several chlorinated benzenes) and mercury were the main contaminants reported at elevated levels in these matrices, but only values for mercury were presented in the ERM report.

### NOAA Trust Habitats and Species

The Tombigbee River, the habitat of primary interest to NOAA, provides essential habitat for many freshwater and anadromous species (Table 2; USFWS 1986; Mettee et al. 1987; Mettee personal communication 1990). The site is approximately 100 km upstream from the river mouth, and the river is usually fresh water at this point. However, during periods of low flow (August through September), saltwater intrusion along the river bottom may extend at least as far as the site (Mettee personal communication 1990).

The Tombigbee River in the vicinity of the site is within the Mobile River delta zone and historically has served as habitat for at least four anadromous species: Atlantic sturgeon, Alabama shad, American eel, and striped bass. Alabama shad were common in the 1940s, but have not been observed inland in the Mobile River system since the early 1970s (Mettee personal communication 1990). Sturgeon also used the river for spawning and nursery habitat, but have not been observed in upstream areas of the river in decades. However, dead specimens have been found at the mouth of the river within the last year (Mettee personal communication 1990). Striped bass have been observed upstream of the

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### NOAA Trust Habitats and Species, cont.

Table 2.  
Species and  
habitat use in the  
Tombigbee  
River.

mouth of the Mobile, but it is unclear whether they currently occur near the site. The Alabama Department of Natural Resources stocks the Mobile River with approximately 20,000 bass each year below the river's confluence with the Tombigbee.

Species		Habitat		Adult Forage
Common Name	Scientific Name	Spawning	Nursery	
<b>ANADROMOUS/CATADROMOUS FISH</b>				
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>			H
Alabama shad	<i>Alosa alabamæ</i>			H
American eel	<i>Anguilla rostrata</i>		H	
striped bass	<i>Morone saxatilis</i>		♦	♦
<b>FRESHWATER FISH</b>				
alligator gar	<i>Lepisosteus spatula</i>			♦
shovelnose sturgeon	<i>Scaphirhynchus sp*</i>			♦
<b>ESTUARINE/MARINE</b>				
<b>Fish</b>				
bay anchovy	<i>Anchoa mitchelli</i>			♦
striped mullet	<i>Mugil cephalus</i>			♦
<b>Invertebrates</b>				
blue crab	<i>Callinectes sapidus</i>			♦
H: historical occurrence; no sampling has been done in recent years to determine if this species still lives in the area.				
*: undescribed species of <i>Scaphirhynchus</i>				

Estuarine species, such as the bay anchovy, have been observed in the Tombigbee River near the site. The inland occurrence record for bay anchovy (450 km) was set in the Mobile River system, and suggests a reproductive, freshwater stock somewhere within the system (Mettee personal communication 1990). Blue crab support a recreational fishery. Saltwater species have been reported during periods of low river flow during summer, including southern flounder, hogchoker, and Atlantic needlefish.

Several predatory freshwater fish species have been sampled near the site, including largemouth bass, rock bass, and bluegill. Freshwater mullet and channel catfish have also been sampled from the Tombigbee River for mercury content (USFWS 1986). Channel catfish is the most important commercial species in the lower Tombigbee. An extremely rare, as yet undescribed, freshwater species of shovelnose sturgeon has been sampled within the Mobile River system (Mettee personal communication 1990).

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### **References**

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Long, E.R., and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA-52. Seattle: Coastal and Estuarine Assessment Branch, NOAA. 175 pp.+ Appendices.

Mettee, M.F., T.E. O'Neil, R. D. Sutthus, and J. Pearson. 1987. Fishes of the lower Tombigbee River system in Alabama and Mississippi. Tuscaloosa, Alabama: Alabama Geological Services. Alabama Geological Service Bulletin 107. 186p.

Mettee, Scott, Biologist, Alabama State Geological Service, Tuscaloosa, Alabama, personal communication, July 26, 1990.

U.S. Environmental Protection Agency. 1986. Quality Criteria for Water. Washington, D.C.: Office of Water Regulations and Standards, Criteria and Standards Division. EPA 440/5-87-003.

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